EFFECTIVENESS OF MYOFASCIAL TRIGGER POINT RELEASE THERAPY COMBINED WITH SELF-STRETCHING PROTOCOL VERSUS SELF- STRETCHING PROTOCOL ALONE IN TREATING PATIENTS WITH UNILATERAL HEEL PAIN- AN EXPERIMENTAL STUDY

Dissertation submitted to

The Tamil Nadu Dr. M.G.R Medical University

Chennai

In partial fulfillment of the requirements for the degree of

MASTER OF PHYSIOTHERAPY

(ADVANCED PHYSIOTHERAPY IN ORTHOPAEDICS)

REG. NO.27101104

APRIL- 2012

COLLEGE OF PHYSIOTHERAPY

SRI RAMAKRISHNA INSTITUTE OF PARAMEDICL SCIENCE

395 SAROJININAIDU ROAD, NEW SIDDHAPUDUR

COIMBATORE-641044

CERTIFICATE

This is to certify that the dissertation work entitled **Effectiveness Of Myofascial Trigger Point Release Therapy Combined With Self-Stretching Protocol Versus Self-Stretching Protocol Alone For Treating Patients With Unilateral Heel Pain –An Experimental Study** was carried out by the candidate bearing the Reg.No by **27101104 (April 2012)** in College of Physiotherapy, SRIPMS, Coimbatore, affiliated to The Tamilnadu Dr. M.G.R Medical University, Chennai towards partial fulfillment of the Master of Physiotherapy (Advanced Physiotherapy in Ortho paedics) under my direct supervision and guidance.

PROF. N. PARAMESWARRI M.P.T. (Gynec),
Principal,
College of Physiotherapy,
SRIPMS,
Coimbatore- 641044.

Place: Coimbatore

Date:

CERTIFICATE

This is to certify that the dissertation work entitled "**Effectiveness Of Myofascial Trigger Point Release Therapy Combined With Self-Stretching Protocol Versus Self-Stretching Protocol Alone For Treating Patients With Unilateral Heel Pain –An Experimental Study"** was carried out by the candidate bearing the Reg.No by **27101104 (April 2012)** in College of Physiotherapy, SRIPMS, Coimbatore, affiliated to The Tamilnadu Dr. M.G.R Medical University, Chennai towards partial fulfillment of the Master of Physiotherapy (Advanced Physiotherapy in Ortho paedics) under my direct supervision and guidance.

PROF.V.S.SEETHARAMAN.,M.P.T (ORTHO),
College of Physiotherapy,
SRIPMS,
Coimbatore- 641044.

Place: Coimbatore

Date:

CERTIFICATE

This is to certify that the dissertation work entitled "**Effectiveness Of Myofascial Trigger Point Release Therapy Combined With Self-Stretching Protocol Versus Self-Stretching Protocol Alone For Treating Patients With Unilateral Heel Pain –An Experimental Study"**

Submitted By

REG.NO. 27101104 (APRIL 2012)

The Tamilnadu Dr.M.G.R Medical University, Chennai towards partial fulfillment of the requirement for the award of degree of **MASTER OF PHYSIOTHERAPY** was evaluated.

---------- ----------

INTERNAL EXAMINER **EXTERNAL EXAMINER**

Place: Coimbatore

Date

DEDICATED TO

GOD ALMIGHTY

PARENTS & SISTER

ACKNOWLEDGEMENT

First and foremost I wish to acknowledge my heartfelt gratitude to the Lord Almighty for his divine blessing and guidance throughout this endeavor.

I am especially indebted to my Family members for their prayerful support, inspiration, love and encouragement throughout this Endeavour.

I express my deep sense of gratitude to **Prof.N.Parameshwarri, M.P.T., Principal,** College of Physiotherapy, and Sri Ramakrishna Hospital for providing the facilities for doing the study.

It's my immense pleasure to extend my sincere thanks to my thesis guide **Prof.Mr.V.Seetharaman.,M.P.T(Ortho),** College of Physiotherapy, Sri Ramakrishna Hospital, for his timely suggestions, valuable guidance, encouragement and constant support throughout the study.

I extend my profound sense of gratitude to **Prof.Mr.K.Saravanan, M.P.T, Prof.Mr.S.Shanthakumar,.M.P.T, Prof.Mr.A.Pahinian.,M.P.T, Prof.Mr.Faith Ragaland,M.P.T, Prof.Ms.M.Sangeetha,M.P.T** and all Faculty Members for their support and concern in making this project a successful one. I devote my special thanks to **Mr.A.Manimaran.,M.P.T,** Sports Therapist, Sparrc Center, for his guidance and support throughout this study.

I express my deep gratitude to all my Friends for their unending source of support and encouragement extended at every stage of my project work.

CONTENTS

1. INTRODUCTION

A myofascial trigger point **(MTP)** has been described as an area of hyperirritability located in a taut band of muscle, variously described as resembling a small pea or rope-like slender nodular crepitant (crackling, grating) area within the muscle that is painful upon palpation and refers pain, tenderness and an automatic (functionally independent) response to remote area. They also exhibit a local twitch response (muscle fasciculation) or "jump sign" (whole body movement) in response to digital pressure or dry needling.

SIMONS described his criteria for identifying trigger points. These criteria include identifying of a taut band in a muscle is accessible; A tender spot on the taut band; Referred pain or altered sensation, at least 2cm beyond the spot; Elicited by digital pressure or needle penetration held for 10 seconds; And restricted Range of motion (ROM) in the joint the muscle crosses.

Dr. Travels' research demonstrated that each muscle has referred pain. This means, a myofascial trigger point is capable of producing triggering pain in a specific pattern; both the areas where it is located and in another part of the body.

Studies have shown that as many as 93% of all pain patients seeking medical intervention for pain presented with myofascial trigger points.

1.1 Causes of Trigger Points

Trigger points have several causes. Some common causes of trigger points are: birth trauma, an injury sustained in a fall or accident, poor posture, or overexertion.

Most heel pain is produced by trigger points in the calf muscle. Though the calf muscles are very strong, they are easily overloaded by everyday activities. The trigger points that develop in these muscles refer pain to the foot for one reason to get you off your feet and allow the overloaded calf muscles to recover.

1.2 The Muscles and Trigger Points that Cause Heel Pain

The trigger points are found in the following muscles that cause heel pain:

- Tibialis posterior.
- Gastrocnemius.
- Soleus.
- Plantaris.

The most commonly involved muscles are:

- The Gastrocnemius
- The Soleus

The **Gastrocnemius** muscle group is the large muscle that makes up the bulk of the calf. It attaches to the large leg bone (the femur), just above the bend in the knee, and runs downward to attach to the Achilles tendon. It contracts to lift the body onto the toes during walking, running, and jumping. Four trigger points can develop in these muscles that refer pain to the arch of the foot, the calf, and the back of the knee regions. The trigger points may also cause calf cramping during the night.

The **Soleus** muscle is a large, flat muscle that lies underneath the Gastrocnemius muscle in the calf region. It attaches to the lower leg bones (the tibia and fibula bones) just below the knee, and runs downward to attach to the Achilles tendon. Like the Gastrocnemius muscle, the Soleus muscle also contracts during walking and running.

1.3 CLINICAL FEATURES OF MYOFASCIAL TRIGGER POINTS

- Muscle tightness and weakness

- Taut band
- Hard nodule formation in the muscle
- Referred pain
- Hyper irritability in the muscle region
- Muscle cramps
- Spot tenderness
- Twitch response

1.4 SELF-STRETCHING

The standard treatment for heel pain includes actively self- stretching the **Gastrocnemius** and **Soleus** (calf) muscles.

In this study, physical therapists from Brazil compare the use of stretching alone with a program of manual therapy combined with stretching. In this instance, manual therapy refers to the release of **trigger points** in the calf. This technique is done by the patient directly over the calf muscles and applying pressure using towels and wall push.

Self-stretching alone doesn't always stop the pain or alleviate the problem. In theory, until the trigger point has been released, the heel pain will continue (or come back as soon as the stretching stops).

Trigger point therapy as described here decreases pressure pain sensitivity. Perhaps it turns off a reflex that is triggering muscle tightness so that the self- stretching becomes more effective

1.5 TRIGGER POINT RELEASE THERAPY

Trigger point release therapy is also called myofascial trigger point release therapy. It was introduced by **Dr. Janet Travel** in the United States in the **1940s**.

The treatment of trigger points has been around for quite some time. There have been several notable physicians who have contributed to this work. Among them are **HANS KRAUS MD** and **JANET TRAVELL MD**, both of whom worked with the complex muscular condition of John F. Kennedy. This therapy employs the use of manual therapy techniques to deactivate trigger points and restore normal range of motion. Once normal range of motion has been achieved a person may return to a pain free lifestyle. Modification of habit, which is generally simple and practical, is usually required to keep the pain from returning as well as some sort of exercise to recondition muscles that once harbored trigger points.

Trigger Point Therapy is used when Myofascial Trigger Points are present in a person's muscles. Myofascial Trigger Points, usually just called Trigger Points, are hyperirritable spots in a muscle associated with a palpable "knot" or "taut band" in the muscle tissue. Trigger Points are painful on compression and can refer pain and tenderness to other areas. Trigger Points are usually ischemic and often cause an entire muscle to be painful, too tight, weak, and more easily fatigued. Trigger Points can be caused by overworking or overstressing muscles, direct trauma to muscles, or even sustained chills. Trigger Points can be either the cause or a contributing factor of a wide variety of painful conditions.

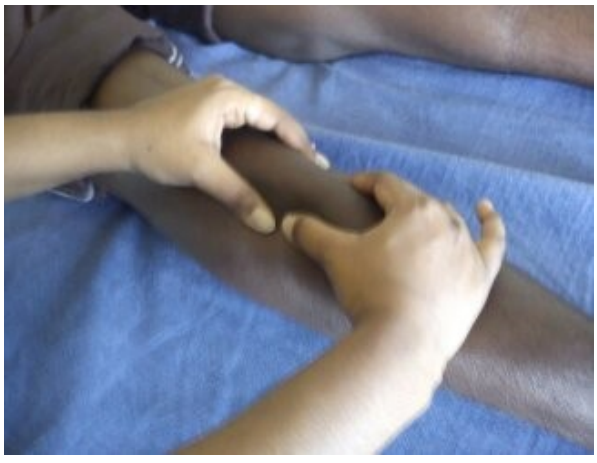
Trigger Point Therapy directly targets the trigger points and the muscles in which they're found. In Trigger Point Therapy the Massage Therapist carefully seeks out the trigger points in a muscle with their fingers and uses specific compression techniques,

friction strokes, and stretches which make the trigger points release and seemingly melt away. The release of the trigger point usually results in a rapid decrease or complete elimination of muscular pain.

Trigger Point Therapy does have a reputation as being a painful therapy to receive. However, despite its reputation as a "no pain, no gain" type of technique Trigger Point Therapy can be quite comfortable to receive. Some clients may experience some mild discomfort during the treatment. This mild discomfort is often described as a "good pain" that rates low on a standard pain scale and is actually welcomed by most clients.

1.6. THE PURPOSE OF TRIGGER POINT RELEASE THERAPY

The purpose of trigger point release therapy is to eliminate pain, range of motion is increased, tension is relieved, and circulation, flexibility and coordination are improved.



performed in calf muscle

1.7. AIM OF THE STUDY

To evaluate the effectiveness of myofascial trigger point release therapy combined with self-stretching protocol versus self-stretching protocol alone for treating patients with unilateral heel pain.

1.8. STATEMENT OF THE PROBLEM

To compare the effectiveness of myofascial trigger point release therapy combined with self-stretching protocol versus self-stretching alone for treating patients with unilateral heel pain.

1.9. OBJECTIVE OF THE STUDY

This study aim is to quantify the reduction in heel pain brought about by myofascial trigger point release therapy combined with self-stretching protocol versus self-stretching protocol alone.

1.10. HYPOTHESIS

The **Null Hypothesis** of this study can be stated as '**There is no significant difference in effects of myofascial trigger point release therapy combined with self-stretching protocol versus self-stretching protocol alone'** in the treatment of patients with unilateral heel pain.

The **Alternative Hypothesis** of this study can be stated as '**There is a significant difference in effects of myofascial trigger point release therapy combined with self-stretching protocol versus self-stretching protocol alone'** in the treatment of patients with unilateral heel pain.

2. REVIEW OF LITERATURE

2.1. TRIGGER POINT RELEASE:

- **Renan- ordine R, Alburque- sendin F, De souza DP (2001)** proposed myofascial trigger release in combination with static stretching is more effective than isolated static stretching in treating plantar heel pain.
- **Mathhew P Cotchett, Karl B Landorf, Shannon E Muntean (2000)** suggested that is a better outcome of trigger release that is associated with heel pain.
- **Suman Kuhar, Khatri Subhash, Jeba Chitra (2007)** Concluded that myofascial trigger release showed additional results in terms of reduction of pain on VAS and functional ability in terms of Foot Function index.
- **Jonathan Kuttner (2008)** Illustrates that when trigger points is activated, it sets off a pain pattern- sometimes causing pain far from the site of the trigger.
- **Shirat Ling (2006)** In his study referred that direct myofascial trigger release is a highly effective technique for plantar heel pain patients who need to recover quickly.
- **Joushua Dubin (2004)** Proposes that improvement in the reduction of heel pain is thus bought down by the myofascial trigger release along with some conservative treatment.
- **Amanda Ferland, Helen Fearon (2008)** Concludes that there nominal evidence to support the use of manual trigger release therapy procedure to provide pain relief and improve the function.
- **Benedict F De Giovanni, Elizabeth Moore (2000)** Suggested that the outcome measures revealed significant results with respect to pain, activity limitation and patient satisfaction with greater improvement seen in subjects with plantar heel stretching program.
- **Christian Lemburg (2010)** Trigger points in the calves will usually cause pain under your foot and arises at predictable places in the muscle and cause predictable patterns of referred pain.

- **McNulty WH, David G. Simons (2002)** Suggests that the effective of myofascial trigger point release is to repeat a series of incremental releases in the tension occurred in the specific region of a muscle.

2.2. SELF- STRETCHING:

- **Anthony Delitto, John Dewitt (2001)** Reports that dosage for calf stretching can be either 3 times a day utilizing either a sustained or intermittent stretching time, as neither dosage produced a better effect.
- **Shari Aizenman (2006)** Reports that self stretching helps to relieve spasm and has a greater role to maintain its length in the muscle.
- **Chris Teldon (2009)** Refers that stretching of calf muscles is one among the healing program to get rid of heel pain.
- **Michifers (2000)** Reports that the good way of stretching the plantar fascia helps to prevent future painful flare ups in heel pain.
- **Radford JA, Landorf KB, Buchbinder R, Cook C (2007)** Reported that there is effectiveness of calf muscle stretching for the short-term treatment of plantar heel pain.
- **Jennifer E Finely (2004)** Reports that physical therapy for patients with myofascial pain focuses on correcting muscle shortening by targeted self – stretching.

2.3. PAIN:

- **David J. Alvarez, D.O and Pamela G. Rocwell, D.O (2003)** Suggested that in the lower extremities, trigger point may involve pain in the calf muscles and lead to a limited range of motion in the ankle.
- **Christian Beckman (2011)** Reports that 93% of all pain patients seeking medical intervention for pain presented with myofascial trigger points.

2.4. FOOT FUNCTION INDEX:

- **Buck Wills, Angel Lopez (2009)** According to them the foot function index is one of the effective tool to analyse the disability in plantar heel pain.
- **Mc Poil TG, Martin RL, Cornwall MW (2008)** Concluded that clinicians should use validated self report questionnaire such as foot function index before and after interventions intended to alleviate the impairments of body, function and structures, activity limitations and restrictions associated with heel pain.

2.5. VISUAL ANALOGUE SCALE:

- **Price DD, McGrath PA, Rafii A (1997)** Refers that visual analogue scale of sensory intensity and affective magnitude were validated as ratio scale measure for both chronic and experimental pain.

3. MATERIALS & METHODOLOGY

3.1. MATERIALS (TOOLS)

- Couch
- Pillows
- Ice pack
- Towel
- Evaluation Chart

3.2. METHODOLOGY

STUDY DESIGN

A pre - test and post- test experimental study design.

Group A (study group) - Patients treated with myofascial trigger point release therapy combined with self – stretching protocol.

Group B (control group) - Patients treated with self- stretching protocol alone.

STUDY SETTING

This study is proposed to conduct in out-patient physiotherapy department, patients referred from department of orthopedics and various other departments of Sri Ramakrishna Hospital, Coimbatore.

STUDY SAMPLING

The sample included in this study is simple random sampling.

Each group assigned with 15 patients.

A sample of 30 patients were randomly selected according to pre- determined inclusion criteria and divided into Group A (Study group -15 patients) and Group B (Control group – 15 patients).

Study group received myofascial trigger point release therapy and self – stretching protocol.

Control group received only self-stretching protocol.

Both groups were evaluated using Visual Analogue Scale and Foot Function Index for every consecutive session. First day pre- test measurement was taken and the outcome was assessed at the end of the week, parameters was assessed

DURATION OF THE STUDY

Total duration of this study is 6 months.

DURATION OF THE TREATMENT

Each patient received the treatment for 45 min, single session for alternative days in a week (3 sessions).

INCLUSION CRITERIA

- Mean age of 40 – 60 years.

- Unilateral involvement.
- Pain felt maximally over plantar aspect of heel.
- Pain perceived while prolonged standing and walking.
- Weakness of calf muscles.

EXCLUSION CRITERIA

- Referred pain due to sciatica and other neurological disorders.
- Calcaneal spur.
- Plantar fasciitis.
- Bilateral involvement.
- IVDP.
- Arthritis.
- DVT.
- Recent fractures in ankle.
- Any metal implants.
- Any Tendo Achilles pathology.

PARAMETERS OF THE STUDY

a) Visual Analogue Scale (VAS) in cms.
b) Foot Function Index.

STATISTICAL TOOL

The statistical method in this experimental study used to show the effectiveness of Group A and Group B was Independent't' test.
The Independent't' test was calculated using the formula

$$t = \frac{\overline{X_1} - \overline{X_2}}{S} \sqrt{\frac{n_1 \; n_2}{n_1 + n_2}}$$

$$S = \sqrt{\frac{\sum \left(X_1 - \overline{X_1}\right)^2 + \sum \left(X_2 - \overline{X_2}\right)^2}{n_1 + n_2 - 2}}$$

X_1 = Difference between pretest and posttest values of Group A

X_2 = Difference between pretest and posttest values of Group B

$\overline{X_1}$ = Mean difference of Group A

$\overline{X_2}$ = Mean difference of Group B

n_1 = No. of samples in Group A

n_2 = No. of samples in Group B

S = Combined standard deviation

TREATMENT TECHNIQUE

TRIGGER POINT RELEASE THERAPY

PATIENT POSITION: Lying prone on the couch with his head rested on the pillow with his/her hands by their side.

Both the legs rested on the pillow.

THERAPIST POSITION: Therapist standing near to affected side of the leg near to the couch.

APPLICATION OF TECHNIQUE:

- Identify the trigger point.

FOR GASTROCNEMIUS:

- The trigger point is palpated in the upper one third of the muscle in the midpoint of the calf muscle.

FOR SOLEUS:

- The trigger point is palpated in the lower one third of the muscle above the Tendo Achilles.
- Apply gentle, gradually increasing pressure to the trigger point, whilst lengthening the affected/host muscle until hitting a palpable barrier.
- This should be experienced by the patient as discomfort and **NOT** pain

- Apply sustained pressure until the trigger point is felt to be softened.
- Repeat, increasing the pressure on the trigger point until meeting the next barrier.

DURATION:

15-minutes

Trigger point release in Gastrocnemius

Trigger point release in Soleus muscle

ICE-PACK:

Ice-pack applied to the trigger point area for 10 mins

USES:

- To reduce sore pain in affected area or any muscle micro tear.
- To improve blood circulation and there by nutrition supply to the tissues.

SELF-STRETCHING TECHNIQUE:

Wall Push-Up (Gastrocnemius)

- Stand with the rear foot approximately two to three feet from the wall.
- The rear leg should be straight, the front leg is bent and your hands touch the wall.
- Feet point straight ahead, heels are on the ground.
- Hold for 10 seconds, switch legs, repeat 10 times.**Calf Stretch with Towel**
- Calf stretch in long sitting with the leg to be stretched in front of the patient.
- The knee and back should be straight and a towel or rigid band placed around the foot that is to be stretched.

- Using the foot, ankle and the towel, the toes should be brought towards the head until a stretch is felt in the back of the calf, Achilles tendon or leg.
- Hold for 5 seconds and repeat 10 times at a mild to moderate stretch provided the exercise is pain free.

Self-stretching for Soleus:

- In standing position the patient is asked to place the foot on the wall.
- Then ask the patient to lean towards the wall.
- Ask the patient to hold for 10 to 15 seconds and repeat 5 times .

Self stretching of calf muscle using towel

Self stretching of calf (wall push)

Self- stretching for Soleus muscle

HOME PROGRAMME

CALF AND FOOT STRENGTHENING EXERCISE:

- Stand on a stair with one hand on the wall (or) railing for support.
- Place the toes on the stair and let the heels to hang.
- Slowly lift the toes, and then return back to the starting position.
- Repeat for 10 times up and down for 3 sets, a total of 30 lifts.

USES:

- Stabilizes and strengthens the calf and foot muscles.
- Prevents heel pain.

BALL ROLL:

- Sit down on a chair.
- Place a tennis ball under the arch of foot.
- Then roll the ball forward and backward with foot.

USES:

- Stretches plantar fascia.
- Relieves pain.

ALPHABET EXERCISE:

- Spell out the alphabet with larger toe.
- Repeat for 3 Times for each feet.

USES:

- Helps to stretch plantar fascia and promote healing.

HEEL OFF AND TOE OFF EXERCISE:

- In sitting position, with hip and knee in 90 degree, heel off and toe off is performed.
- Hold for 5 sec and repeated for 10 times.

Toe off exercise in sitting position

Heel off in sitting position

Ball roll

Heel stretch exercise

Heel stretch exercise while lifting the toe

VISUAL ANALOGUE SCALE- GROUP A

S.No.	Pre test	Post test	X1	$\left(X_1 - \overline{X_1}\right)$	$\left(X_1 - \overline{X_1}\right)^2$
1	7	4	3	0.1	0.01
2	7	4	3	0.1	0.01
3	8	4	4	1.1	1.21
4	7	4	3	0.1	0.01
5	6	4	2	-0.9	0.81
6	7	5	2	-0.9	0.81
7	8	4	4	1.1	1.21
8	7	5	2	-0.9	0.81
9	7	4	3	0.1	0.01
10	8	4	4	1.1	1.21
11	7	5	2	-0.9	0.81
12	7	4	3	0.1	0.01
13	8	4	4	1.1	1.21
14	7	5	2	-0.9	0.81
15	7	4	3	0.1	0.01

Mean = 2.9

VISUAL ANALOGUE SCALE

GROUP A

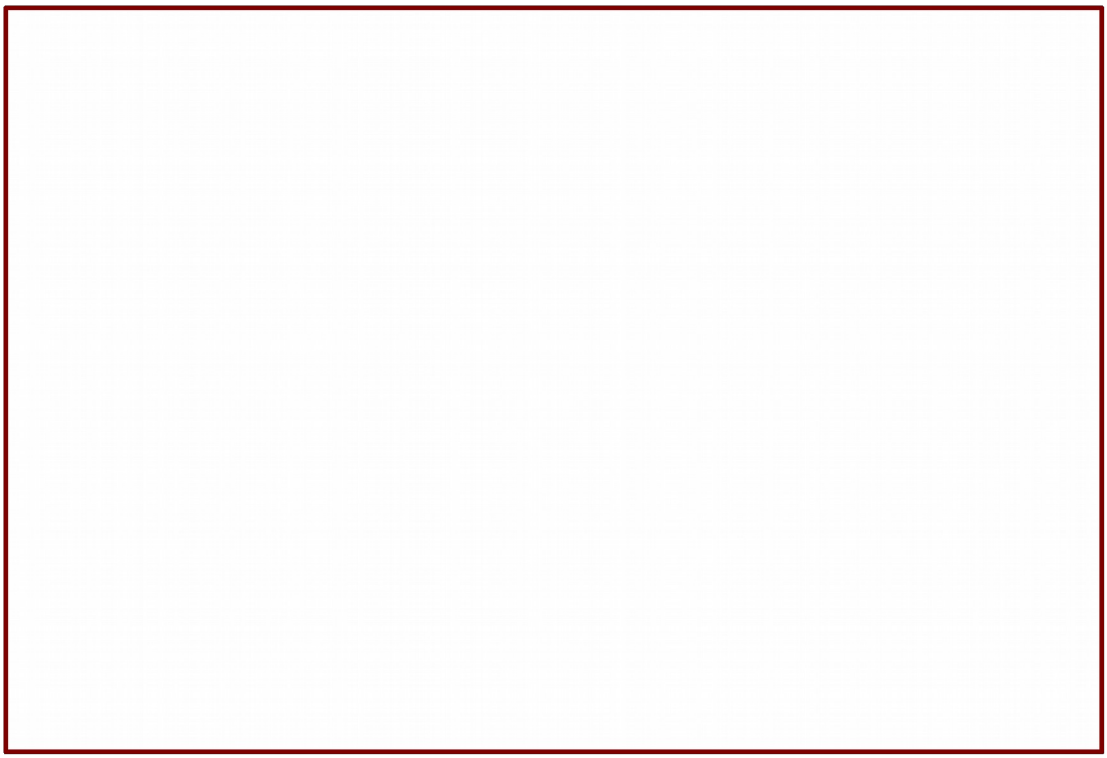
VISUAL ANALOGUE SCALE - GROUP B

S.No.	Pre test	Post test	**X2**	$\left(X_2 - \overline{X_2}\right)$	$\left(X_2 - \overline{X_2}\right)^2$
1	7	6	1	-0.13	0.0169
2	8	6	2	0.87	0.7569
3	7	6	1	-0.13	0.0169
4	7	6	1	-0.13	0.0169
5	7	5	2	0.87	0.7569
6	8	7	1	-0.13	0.0169
7	6	5	1	-0.13	0.0169
8	7	6	1	-0.13	0.0169
9	8	7	1	-0.13	0.0169
10	8	7	1	-0.13	0.0169
11	8	7	1	-0.13	0.0169
12	7	6	1	-0.13	0.0169
13	8	7	1	-0.13	0.0169
14	7	6	1	-0.13	0.0169
15	8	7	1	-0.13	0.0169

Mean =1.13

VISUAL ANALOGUE SCALE

GROUP B



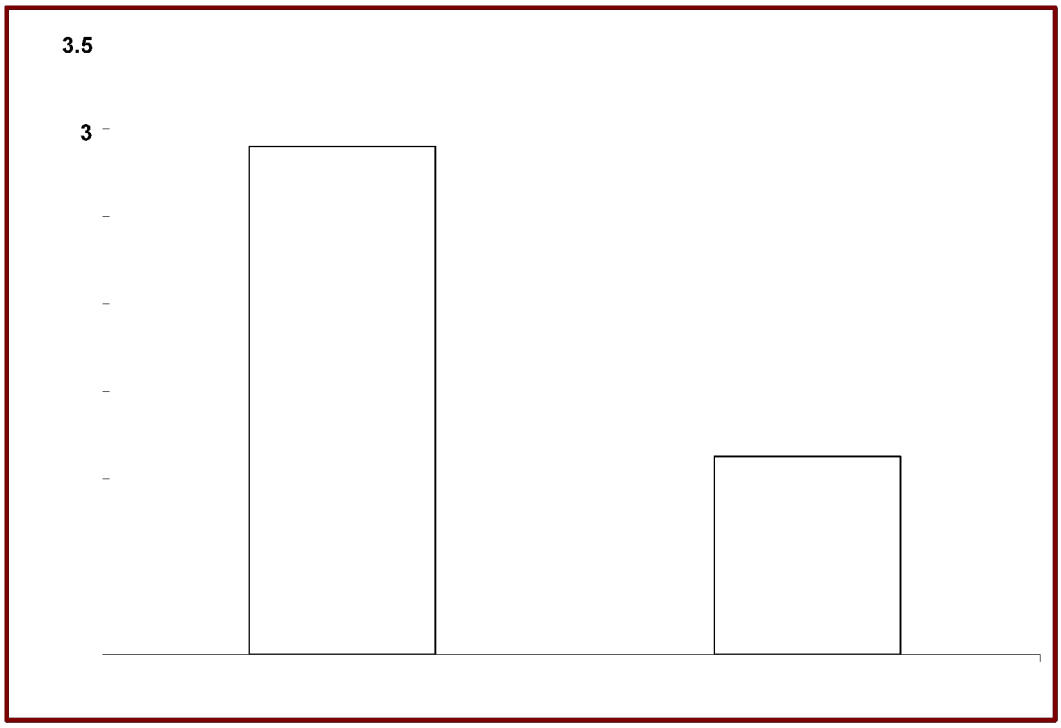
MEAN DIFFERENCE BETWEEN GROUP A AND GROUP B

VISUAL ANALOGUE SCALE

Parameter	Groups	Mean	Calculated 't' value	Table value
VAS	Group A	1.13	3.54	2.763
	Group B	2.9		

MEAN DIFFERENCE BETWEEN GROUP A AND GROUP B

VISUAL ANALOGUE SCALE



FOOT FUNCTION INDEX GROUP A

S. No	Pre test	Post test	**X1**	$\left(X_1 - \overline{X_1}\right)$	$\left(X_1 - \overline{X_1}\right)^2$
1	72.3	36.2	36.1	2.85	8.1225
2	76.2	37.2	39	3.25	10.5625
3	70.5	39.4	31.1	4.65	21.6225
4	70.5	36	34.5	3.25	10.5625
5	74.7	34	40.7	4.95	24.5025
6	70.5	25.2	45.3	5.75	33.0625
7	71.1	36.1	35	4.5	20.25
8	72.3	33	39.3	3.55	12.6025
9	70	31	39	2.75	7.5625
10	75.2	32.2	43	7.25	52.5625
11	71.1	31.1	40	4.25	18.0625
12	71.1	36.3	34.8	4.05	16.4025
13	70.5	35	35.5	4.05	16.4025
14	74.7	34.2	40.5	4.75	22.5625
15	71.1	31.1	40	4.25	18.0625

Mean = 38.2

FOOT FUNCTION INDEX

GROUP A

FOOT FUNCTION INDEX GROUP B

S. No.	Pre test	Post test	X_2	$\left(X_2-\overline{X_2}\right)$	$\left(X_2-\overline{X_2}\right)^2$
1	71.1	41.7	29.4	2.6	6.76
2	70.5	39.4	31.1	-0.9	0.81
3	70.5	41.1	29.4	-2.6	6.76
4	71.1	39.4	31.7	-0.3	0.09
5	70	41.1	28.9	-3.1	9.61
6	72.3	40.5	31.8	-0.2	0.04
7	75.2	40	35.2	3.2	10.24
8	71.7	41.1	30.6	-1.4	1.96
9	74.7	44.1	30.6	-1.4	1.96
10	73.5	40.5	33	1	1
11	74.7	40.5	34.2	2.2	4.84
12	71.1	38.2	32.9	0.9	0.81
13	70.5	37	33.5	1.5	2.25
14	72.3	38.8	33.5	1.5	2.25
15	75.2	40.5	34.7	2.7	7.29

Mean = 32.3

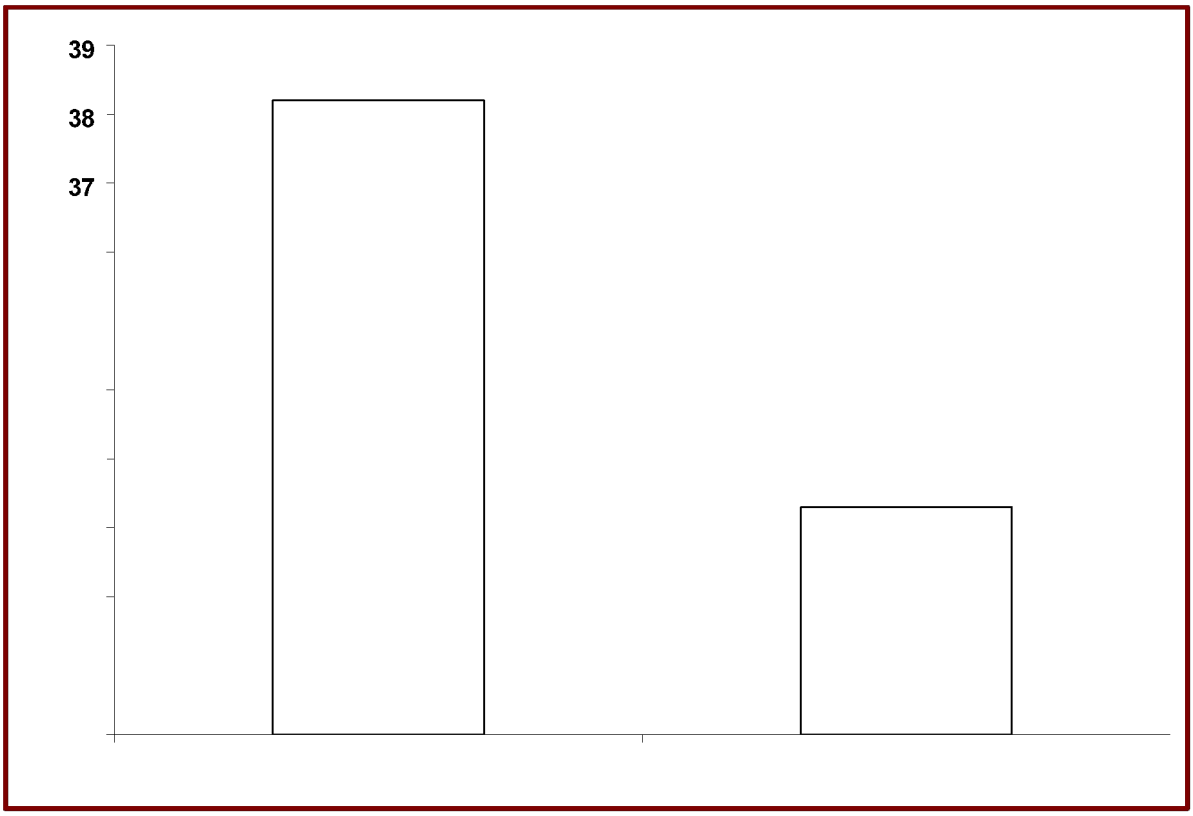
FOOT FUNCTION INDEX

GROUP B

MEAN DIFFERENCE BETWEEN GROUP A AND GROUP B FOOT FUNCTION INDEX

Parameter	Groups	Mean	Calculated 't' value	Table value
FFI	Group A	38.2	4.61	2.763
	Group B	32.3		

MEAN DIFFERENCE BETWEEN GROUP A AND GROUP B FOOT FUNCTION INDEX



5. DISCUSSION

This was an experimental study conducted to evaluate and to compare the effectiveness of trigger point release therapy and self-stretching protocol versus self-stretching protocol alone in treating patients with plantar heel pain.

For my study I have received thirty six patients. Out of thirty six, six patients were discarded due to irregular follow up. Thirty subjects were assigned for the treatment and were divided into two groups.

The statistical analysis was performed between these two groups namely trigger point release therapy along with self-stretching protocol and self-stretching protocol alone. Treatment duration was given alternative days in a week.

The parameters taken for this study was visual analogue scale and foot function index. The values were assessed for both the groups using these two parameters before and after the treatment duration.

The results of this study suggest that the combination of trigger point release therapy and self-stretching protocol results in short term outcomes when compare to self-stretching protocol alone in the treatment of patients with plantar heel pain .

Both the results were statistically analyzed by using independent t test.

Pain was found to reduce effectively in experimental group when compared to control group using VAS. In the independent t test the t value is 3.54. The t value is greater than the one tailed table value 2.763 with 28 degrees of freedom at p= 0.05 respectively. The decrease in pain and reduction in disability was effective in experimental group when compared to control group. In functional improvement the

independent t test the t value is 4.61. This t value greater than the table value 2.763 with 28 degrees of freedom at p=0.05 respectively. Hence we can reject the null hypothesis and accept the alternative hypothesis. There for the treatment given in experimental group reduces pain effectively than control group.

6. CONCLUSION

Based on statistical analysis from the data collected have shown significant reduction in pain and improvement in foot function index in the group underwent treatment of trigger point release therapy and self-stretching in patients with unilateral heel pain when compared to the self-stretching protocol group.

Hence the null hypothesis is rejected and the alternate hypothesis of this study is accepted and it could be stated as "**There is a significant difference in effects of myofascial trigger point release therapy combined with self-stretching protocol versus self-stretching protocol alone.**"

LIMITATIONS AND RECOMMENDATIONS

LIMITATIONS

Though carried out the best of the efforts this study have the following limitations

- Short time bound study.
- Further there is also a lack of long term follow up.
- The study has the small sample size.
- Recurrence of the condition is not been assessed.

RECOMMENDATIONS

Based on the outcome of the statistical analysis it is suggested that the further studies should be modified to accommodate the following changes

- Large sample size.
- Long term follow up to analyze the effect of trigger point release therapy and self-stretching protocol and trigger point release alone.
- Multiple groups can be included for the study.
- Calf Muscle strengthening exercise can also be used along with self-stretching protocol.
- Ultra sound Therapy can be included to treat trigger point along with my study.

7.BIBLIOGRAPHY

- Simons DG: Myofascial pain syndrome: one term but two concepts; a new understanding. (Editorial) J Musculoskeletal Pain 3(1):7-33, **2000.**
- Travell JG, Simons DG: Myofascial Pain and Dysfunction: The Trigger Point Manual, Vols. 1 and 2. Williams & Wilkins, Baltimore, **1983**.

- Skootsky SA, Jaeger B, Oye RK: Prevalence of myofascial pain in general internal medicine practice. West J Med 151:157-100, **2001.**
- Gerwin RD: The management of myofascial pain syndromes. J Musculoskeletal Pain 1(3/4):83-94, **2002.**
- Fricton JR: Myofascial pain: clinical characteristics and diagnostic criteria. J Musculoskeletal Pain 1(3/4):37-47**, 2002**.
- Rosen NB: The myofascial pain syndromes. Physical Medicine and Rehabilitation Clinics of North America 4:41-63, **2010.**
- Kraus H, Fischer AA: Diagnosis and treatment of myofascial pain. The Mount Sinai Journal of Medicine 58:235-249, **2003**.
- Yunus MB: Understanding myofascial pain syndromes: a reply. J Musculoskeletal Pain 2(l):147-149, **2001**.
- Travell JG, Simons DG: Myofascial Pain and Dysfunction: The Trigger Point Manual 5(3): 5-23, **1999**.
- Hong CZ, Chen YN, Twehous DA, Hong DH: Pressure threshold for referred pain by compression on the trigger point and adjacent areas. In press, J Musculoskeletal Pain: **2000**.
- Travell JG, Simons DG: Myofascial Pain and Dysfunction: The Trigger Point Manual, Vol 2. Williams & Wilkins, Baltimore, **1992.**
- Scudds RA, Landry M, Birmingham T, Buchan J, Griffin K: The frequency of referred signs from muscle pressure in normal healthy subjects. J Musculoskeletal Pain 3(Suppl 1): **2005** (Abstract).
- GerwinRD, Shannon S, Hong C-Z, Hubbard D, Gevirtz R: Identification of myofascial trigger points: inter-rater agreement and effect of training. J Musculoskeletal Pain 3(Suppl 1):55, **2002** (Abstract).
- Mense S: Referral of muscle pain: new aspects. Amer Pain Soc J 3:1-9**, 2000.**
- Harden, R., et.al, Signs and symptoms of the myofascial pain syndrome: A national survey of pain management providers clinical journal of pain 16, 64- 72, **2000**.
- Esenyel et.al., Treatment of myofascial pain. American journal of physical medicine and rehabilitation 79(1); 48-52 January/ February **2001**.

- Mcclafin RR., myofascial pain syndrome: Primary care strategies for early intervention postgarad med. 96:56-73, **2004** (Medline).
- Levine M, Lombardo J, Mc Neeley J, et al. ; An analysis of individual stretching programs of intercollegiate atheletes. Phys Sports med 15: 130-138, **2007.**
- Rubin D; An approach to the management of myofascial trigger point syndrome. Arch Phys Med Rehabilitation 62:107-110**, 2001.**
- Simons DG: Myofascial pain syndrome due to trigger points, Chapter 45, In Rehabilitation Medicine edited by Joseph Goodgold. C.V. Mosby Co., St. Louis **1998**(pp.686-723, see pp.691,719).
- Simon J. Bartold. Plantar heel pain: Overview and management. Journal of Bodywork and Movement Therapies. 214- 226:**2004.**
- Gill LH. Conservative treatment for painful heel syndrome. Proceeding of the third Annual Summer Meeting. Foot Ankle. 8- 122:**2001**.
- Heel pain: Hands on physical therapy and stretching prove effective for treating Heel pain. J Orthop. Sports Phy Ther **2011**; 41(2): 51-51 doi 10.2519/ jospt. **2011**. 0501.

APPENDIX I

ASSESSMENT CHART

SUBJECTIVE ASSESSMENT

Name

Age

Sex

Occupation

Address

IP/ OP Number

Date of evaluation

Chief complaints

HISTORY

Past medical history

Present medical history

Onset

Duration

Surgical history

Drug history

Personal history

ASSOCIATED PROBLEMS

Vital signs

Temperature

Pulse rate

Respiratory rate

Blood pressure

PAIN ASSESSMENT

Side

Site

Type of pain

Duration of pain

Aggravating factors

Relieving factors

Grading of pain

VISUAL ANLOGUE SCALE

No Pain										**Severe pain**
0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

OBJECTIVE ASSESSMENT

ON OBSERVATION

Built

Posture

ON PALPATION

Tenderness

Warmth

Swelling

ON EXAMINATION

Range of Motion

MOVEMENT	PRE TREATMENT	POST TREATMENT
Ankle Dorsi flexion		
Ankle Plantar flexion		
Knee flexion		
Knee extension		

SENSATIONS

Superficial

Deep

INVESTIGATION

DIAGNOSIS

PROBLEM LIST

AIMS

MANAGEMENT

HOME PROGRAM

APPENDIX II

FOLLOW UP CHART

Name

Age

Sex

side

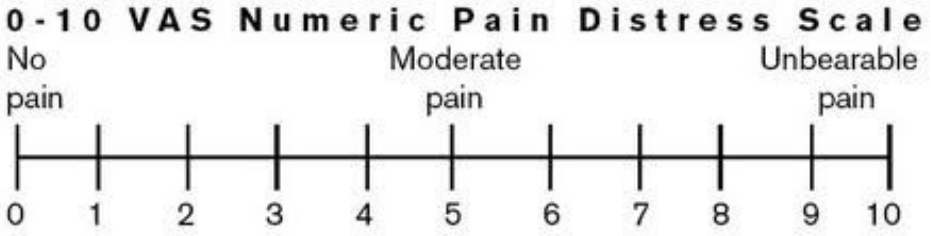
Diagnosis

PARAMETERS	PRE TEST	POST TEST
VAS		
Foot function index		

Treatment plan

APPENDIX III

VISUAL ANALOGUE SCALE



VAS is used to quantify the severity of pain. VAS consists of 10cm horizontal line with 2 end points. One end was labeled as "No pain" and other end labeled as "Severe pain".

The patients were required to mark the line at the point corresponding to the severity of pain which indicates the level of pain intensity presently felt by the patient.

The investigator then measures the distance from the 2 ends at the VAS for the evaluation of pain. VAS is also as a numerical index for severity of pain.

APPENDIX IV

FOOT FUNCTION INDEX (FFI)

This questionnaire has been designed to give you therapist information as to have your food pain has affected your ability to manage in everyday life. Please answer every question. For each of the following questions, we would like you to score each question on a scale from 'O' (no pain (or) difficulty) to 10 (worst pain imaginable (or) so difficult it required help) that best describes your foot over the past week. Please read each quotation and place a number from 0-10 in the corresponding box.

Section I : To be completed by patient (N)_____ Age _____ Occupation _____ No. of days of foot pain.		
Section II: To be completed by patient No pain 0 1 2 3 4 5 6 7 8 9 10 Worst pain imaginable		
1.	In the morning upon taking your first step	
2	When Walking?	
3	When standing?	
4	How is your pain at the end of the day?	
5	How severe is you pain at its worst?	

Answer all of the following questions related to your pain and activities over the past week, how much difficulty did you have?

Disability Scale

No difficulty 0 1 2 3 4 5 6 7 8 9 10 So difficulty Unable to do

6	When walking in the house	
7	When walking outside?	
8	When walking four blocks?	
9	When climbing stairs?	
10	When descending stairs?	

11	When standing tip toe?	
12	When getting up from a chair?	
13	When climbing curbs?	
14	When running or fast walking	

Answer all the following question related to you pain and activities over the past week. How much of the time did you.

Disability scale.

No difficulty 01 2 3 4 5 6 7 8 9 10 All of the time

15	Use an assistive device (crutches, cane walker etc.) indoor?	
16.	Use an assistive device (cane, walker, crutches etc.) out door?	
17.	Limit physical activities	

SECTION 3

To be completed by PT/ Provide

SCORE: _____ / 170 x 100 = _____

Initial: _____

Discharge: _____